Assessing Value/Calculating ROI

HIT Summit Pre-conference II: Health Information Technology Implementation: Capital, Reimbursement and Payment Incentives, ROI and a View from Wall Street

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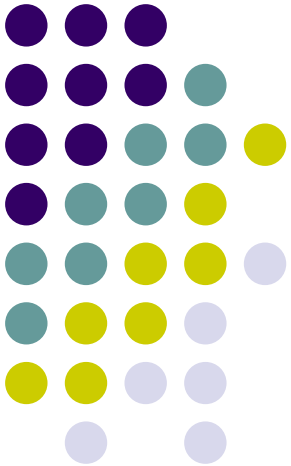

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PARTNERS HEALTHCARE

Overview

- In the Decade of Healthcare IT
  - Healthcare Problems without HIT
- What is the business case?
  - ACPOE, HIEI
- Issues to consider

Healthcare Cost Challenges

- US Healthcare expenditures are $1.7T in 2004, or 15% of GDP, 17% by 2012
- Return of double digit healthcare insurance premium increases (Up 11% in 2003)
- Employer healthcare benefit costs expected to rise 12% on average in 2004
- Prescription expenses projected to increase 12% in 2003

Healthcare Challenges

- Medical error, patient safety, quality and cost issues
  - 1 in 4 prescriptions taken by a patient are not known to the treating physician
  - 1 in 7 admissions result from missing ambulatory information
  - 1 in 5 lab and xray tests ordered because originals can not be found
  - 40% of outpatient prescriptions unnecessary
  - Patients receive only 54.9% of recommended care
- Providers have incomplete knowledge of their patients
  - Patient data unavailable in 81% of cases in one clinic, with an average of 4 missing items per case.
  - 18% of medical errors are estimated to be due to inadequate availability of patient information.

Healthcare Challenges

- Fractured healthcare delivery system
  - Medicare beneficiaries see 1.3 – 13.8 unique providers annually,
  - On average 6.4 different providers/yr
  - 1 in 10 tests were ordered on the same patient by more than one physician
  - Patient's multiple healthcare records do not interoperate
- An 'unwired' healthcare system
  - 90% of the >30B healthcare transactions in the US every year are conducted via mail, fax, or phone

Summary of the Scope of the Outpatient Care Problem

- For Every:
  - 1000 patients coming in for outpatient care
  - 1000 outpatients who are taking a prescription drug
  - 1000 prescriptions written
  - 1000 women with a marginally abnormal mammogram
  - 1000 referrals
  - 1000 patients who qualified for secondary prevention of high cholesterol

- There Appear to Be:
  - 14 patients with life-threatening or serious ADEs
  - 90 who seek medical attention because of drug complications
  - 40 with medical errors
  - 360 who will not receive appropriate follow-up care
  - 250 referring physicians who have not received follow-up information 4 weeks later
  - 380 will not have a LDL-C, within 3 years, on record

IOM Quality Chasm Report

- “If we want safer, higher-quality care, we will need to have redesigned systems of care, including the use of information technology to support clinical and administrative processes.”
  - IOM, Quality Chasm report, 2001

Why the attention on interoperability?

- “Unless interoperability is achieved, physicians will still defer IT investments, potential clinical and economic benefits won’t be realized, and we will not move closer to badly needed healthcare reform in the US.”

  - Dr. David Brailer, DHHS National HIT Coordinator, press conference May 21, 2004

Perspectives on HIT Value

- Myopic View
  - The value of CDSS, EHR, IT support of workflow and process re-engineering within a clinical entity
  - Largely a private good
- Non-Myopic View
  - The value of IT to support exchange and sharing of clinical information
  - Largely a public good

How Does EMR Improve Clinical Outcomes?

- Streamline, structure order process
- Ensure completeness, correctness
- Perform drug interaction checks
- Supply patient data
- Calculate and adjust doses based upon age, weight, renal function

How Does EMR Improve Medication Utilization?

- Eliminate over-use, under-use, and misuse
- Check for duplicate medications
- Suggest
  - Brand to generic substitutions
  - Alternative cost-effective therapies
  - Formulary compliance

How Does EMR Improve Lab and Radiology Utilization?

- Charge display
- Redundant test reminders
- Structured ordering with counter-detailing
- Consequent or corollary orders
- Indication-based ordering

Other EMR Process Benefits

- Reduced transcription costs
- Reduced chart pulls
- Improved clinical messaging and workflow
- Improved charge capture and accounts receivable
- Improved referral coordination
- Improved patient communication and service

How does healthcare information exchange impact the bottom line?

- Largely, TBD
- Expected effects
  - Reduced healthcare information management labor costs
  - Reduced duplicative tests and procedures
  - Reduced medical error
  - Improved service delivery efficiency
  - Improved patient convenience
  - Reduced fraud and abuse

CITL Overview

Center for Information Technology Leadership

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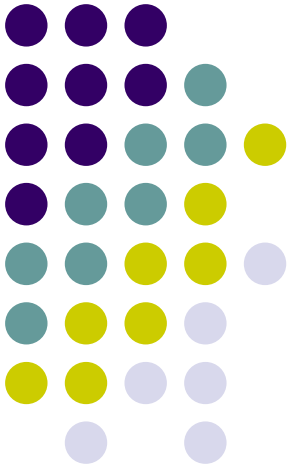

Center for IT Leadership Mission

- Produce timely, rigorous market-driven technology assessments which:
  - Help providers invest wisely
  - Help IT firms understand value proposition
  - Help shape public policy
- Established at Partners HealthCare in partnership with HIMSS

C!TL – Improving Healthcare Value

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CITL Support

- **Major supporters**
  - Partners HealthCare
  - HIMSS
- **Foundations**
  - California HealthCare Foundation
  - Robert Wood Johnson Foundation
  - eHealth Initiative
- **Corporate sponsors**
  - Eclipsys
  - IDX
  - InterSystems
  - Cap Gemini Ernst & Young
  - Siemens
  - McKinsey & Co.
- **Federal Grants**
  - AHRQ Healthcare Information Technology Resource Center (HITRC)

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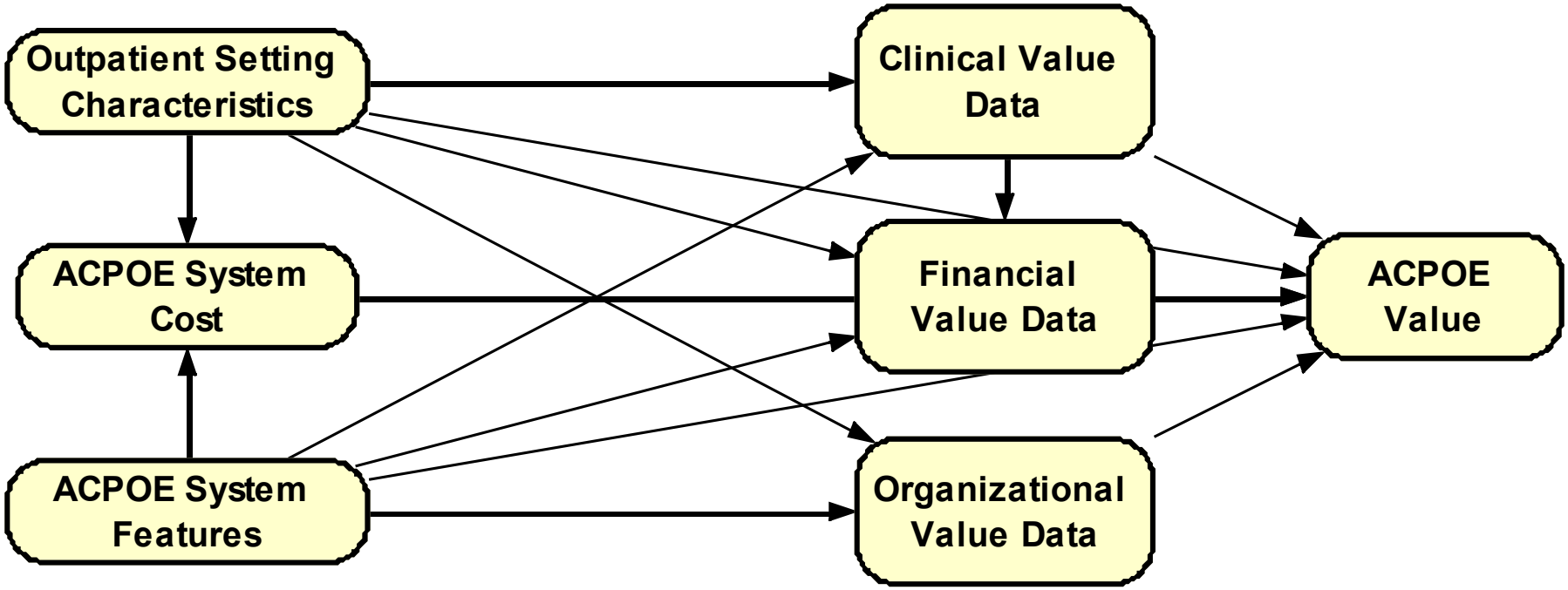
Three Analyses of EHR Value

- The Value of Ambulatory Computerized Provider Order Entry (ACPOE)
- Partners LMR ROI Analysis
- The Value of Healthcare Information Exchange and Interoperability

CITL ACPOE Model – Top View



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ACPOE System Classification

Class	Medication (Rx) OE	Diagnostic (Dx) OE
1: Basic Rx-only	Structured data capture, passive references, no patient data, no EDI	
2: Basic Rx-Dx		
3: Intermediate Rx-only	Rx & Order-specific decision support, limited patient data, no EDI	
4: Intermediate Rx-Dx		
5: Advanced Rx-Dx	Sophisticated Rx & Order-specific decision support, maximum patient data, full EDI	

The “Average” Outpatient Provider

- Full-time ambulatory provider
- Panel size: approximately 2,000
- Annual visits: 3,875
- Capitation rate: about 11.6%
- Total Rx, Lab, Radiology expenditures (almost $1.2M):
  - Rx: $650K
  - Lab: $166K
  - Radiology: $355K

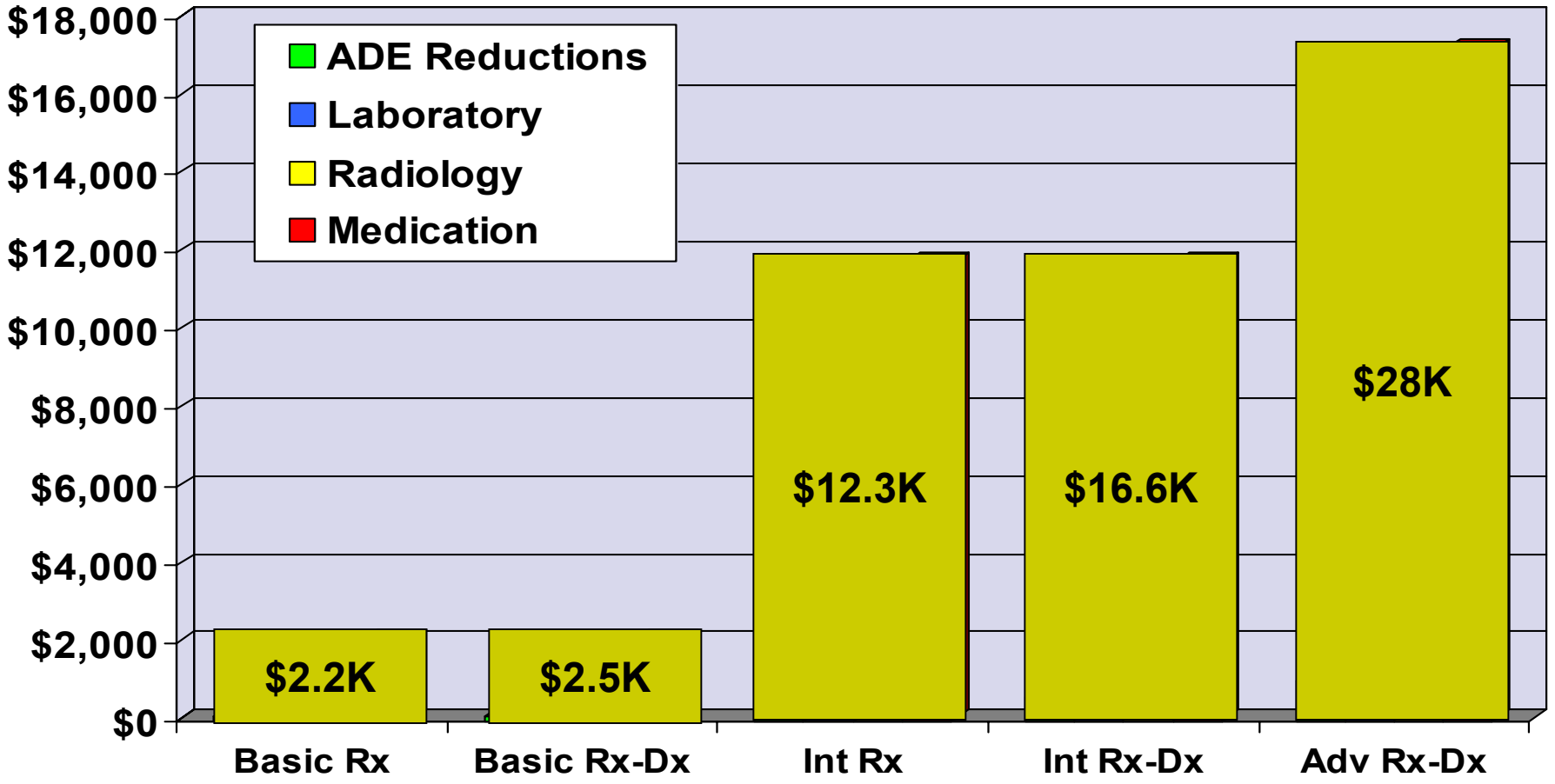
Clinical Impact of ACPOE

- Per “average” provider, Advanced ACPOE systems would prevent…
  - 9 ADE/yr
  - 6 ADE visit/yr
  - 4 ADE admission/5yr
  - 3 life-threatening ADE/5yr

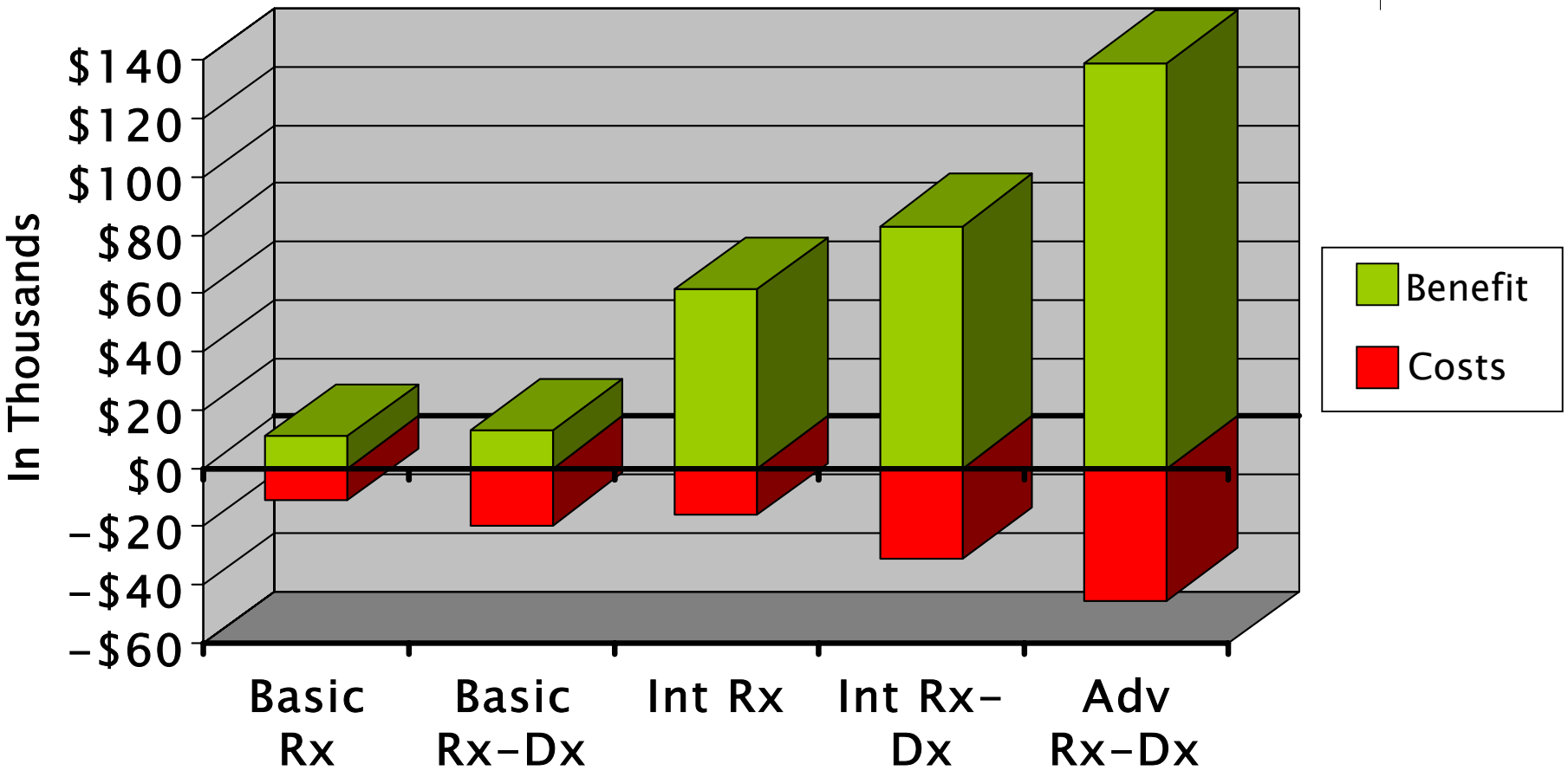
ACPOE Financial Benefits

- Cost Savings
  - Using national average capitation rate of 11.6%
  - Save $28,000 per “average” provider per year
- Revenue Enhancements
  - Eliminate more than $10 in rejected claims per outpatient visit
  - Address drug, procedure and coding issues through advanced clinical decision support
- Productivity Gains
  - Neutral effect on provider time with improved staff productivity

Per "Average" Provider Annual Cost Saving Projections



5 Yr Net Cost-Benefit for 25 Providers



Advanced Systems Produce Superior Returns

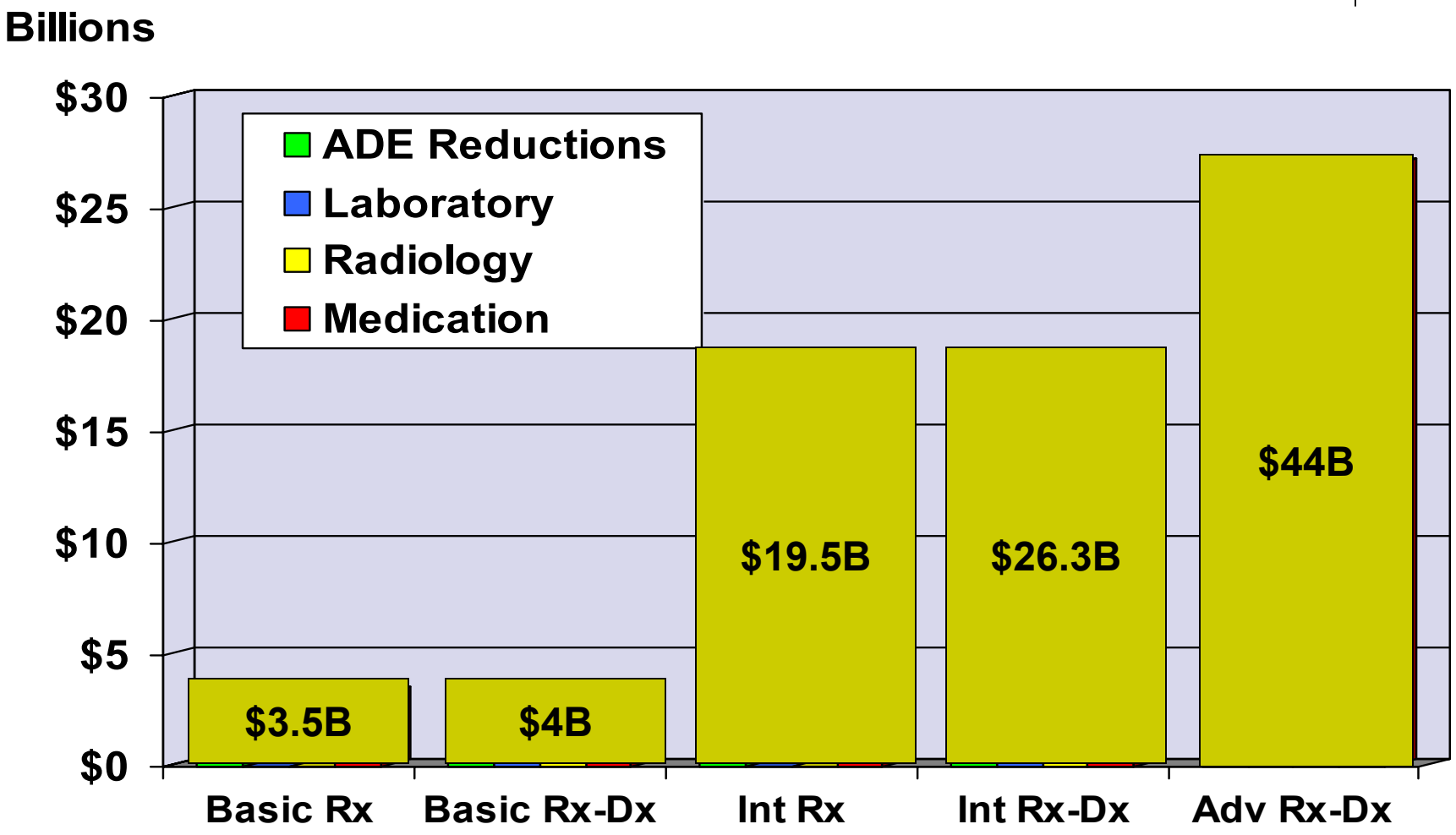
For example, Advanced ACPOE costs nearly 4x as much as Basic, but…

- Generates over 12x more financial returns
- Produces nearly ten-fold greater reduction in number of ADEs
- Provides IT infrastructure for core clinical computing – the outpatient EMR – which produces additional benefits
- Pays for itself within first two years

ACPOE Limitations

- Our model combines evidence from the academic literature, experts, and market data
- We extrapolate to make national projections
- The model may be incomplete and important determinants missing
- There is no “average” provider
- Benefits accrual to providers most sensitive to:
  - Percent of capitation of patient panel
  - Practice size (number of providers)
  - Visit volume

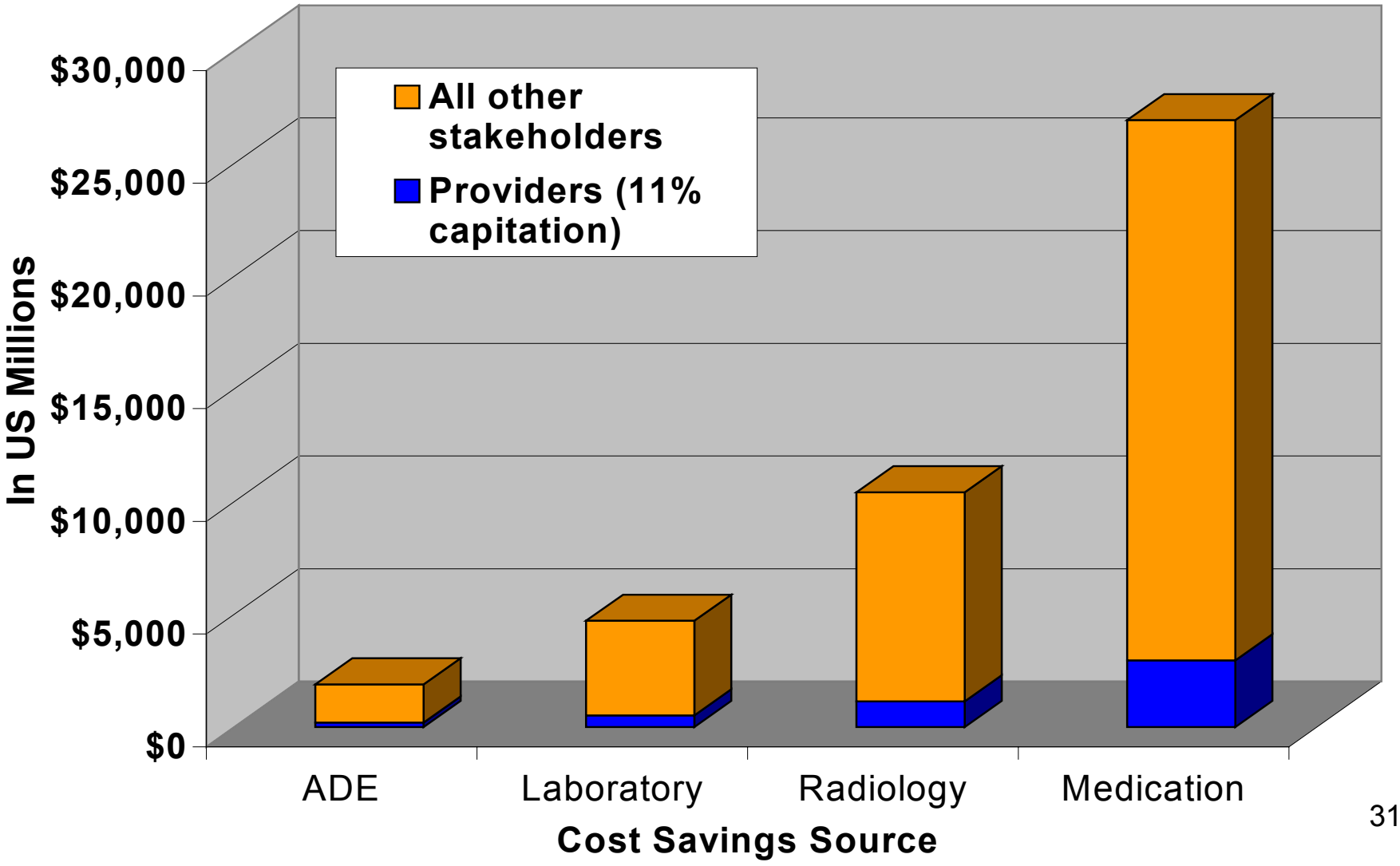
National Annual Cost Saving Projections



ACPOE Limitations

- National benefits may be difficult to realize
  - Provider adoption slowed by benefits accruing to other healthcare stakeholders
  - Example: Drug substitution and lab utilization savings go largely to payers

National Cost Savings to Providers and Other Healthcare Stakeholders



US Healthcare System Will Benefit

- National adoption of Advanced ACPOE systems would prevent…
  - 2 million ADE/yr
  - 190,000 ADE admission/yr
  - 130,000 life-threatening ADE/yr
- Nationwide implementation of advanced ACPOE could:
  - Save the US $44 billion annually

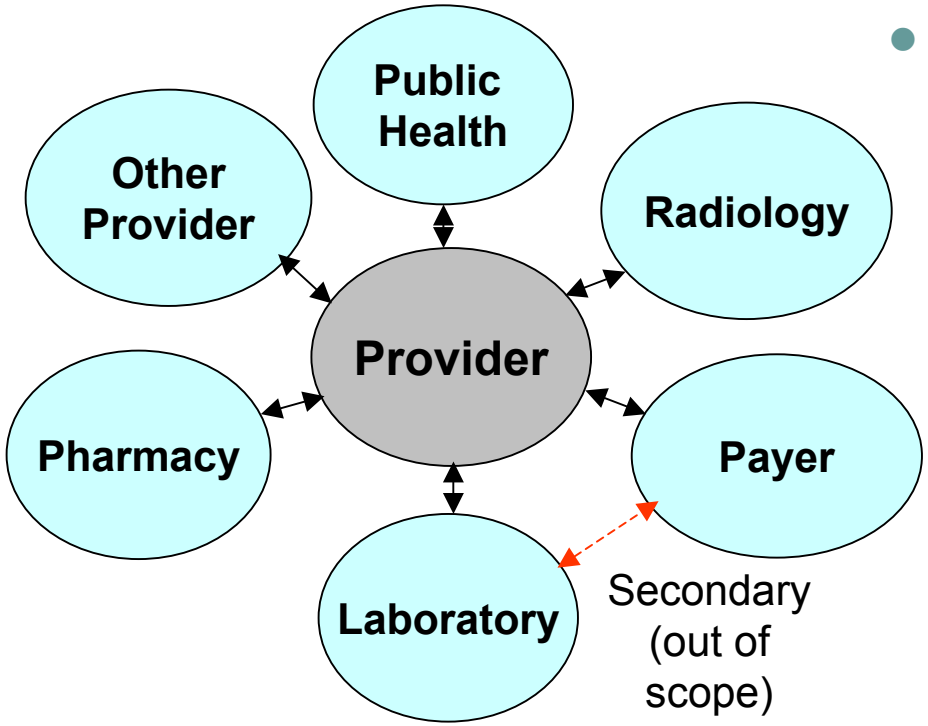
Value of Healthcare Information Exchange and Interoperability HIEI: Key Findings

- **Standardized, encoded, electronic healthcare information exchange would:**
  - Save the US healthcare system $337B over a 10-year implementation period
  - Save $78B in each year thereafter
  - Total provider net benefit from all connections is $34B
  - Net benefits to other stakeholders:
    - Payers $22B
    - Laboratories $13B
    - Radiology centers $8B
    - Pharmacies $1B
    - Public Health $0.1B

- **Dramatically reduce the administrative burden associated with manual data exchange**
- **Decrease unnecessary utilization of duplicative laboratory and radiology tests**

HIEI Definition

- Provider-centric encounter-based model of clinical information exchange



- Clinical and administrative transactions and data exchange
  - Between providers and other providers
  - Between providers and labs, pharmacies, payers, radiology centers, and public health departments

Flow of Healthcare Information

Clinical Encounter

Diagnosis

Treatment

Claims and Billing

Public Health

Prescription

Pharmacy

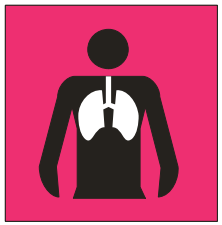
Order

Results

Lab

Order

Results



Imaging Center

Remittance advice

Eligibility,

Referrals, CSI

Claims attachments, Claims submission, Coordination of benefits

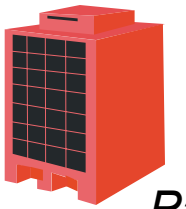
Referral Request

Chart Request

Other Provider

Disease Reports, Vital Statistics

Local Public Health Dept.



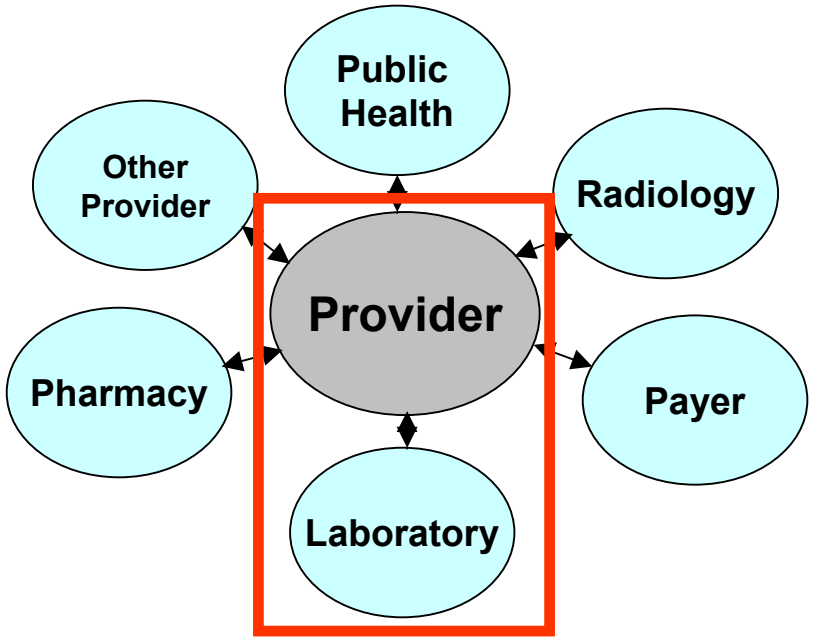
Payer

HIEI Taxonomy

Level	Description	Examples
1	**Non-electronic data**	No PC/information technology
2	**Machine-transportable data**	Fax/Email
3	**Machine-organizable data**	Structured messages, non-standard content/data
4	**Machine-interpretable data**	Structured messages, standardized content/data

Principal Cost Model Components

- For providers:
  - Number of interfaces
  - Interface costs
  - System costs
- For stakeholders:
  - Number of interfaces
  - Interface costs



National Implementation Schedule

- Assume a 10-year technology rollout and usage schedule
- Ramp up the adoption of systems and interfaces over the first five years, with 20% adoption per year
- Ramp up the benefit from technology over five years, beginning with 50% benefit in the first year of adoption and increasing by 10% each year
- On a national basis, the return is then realized as follows:

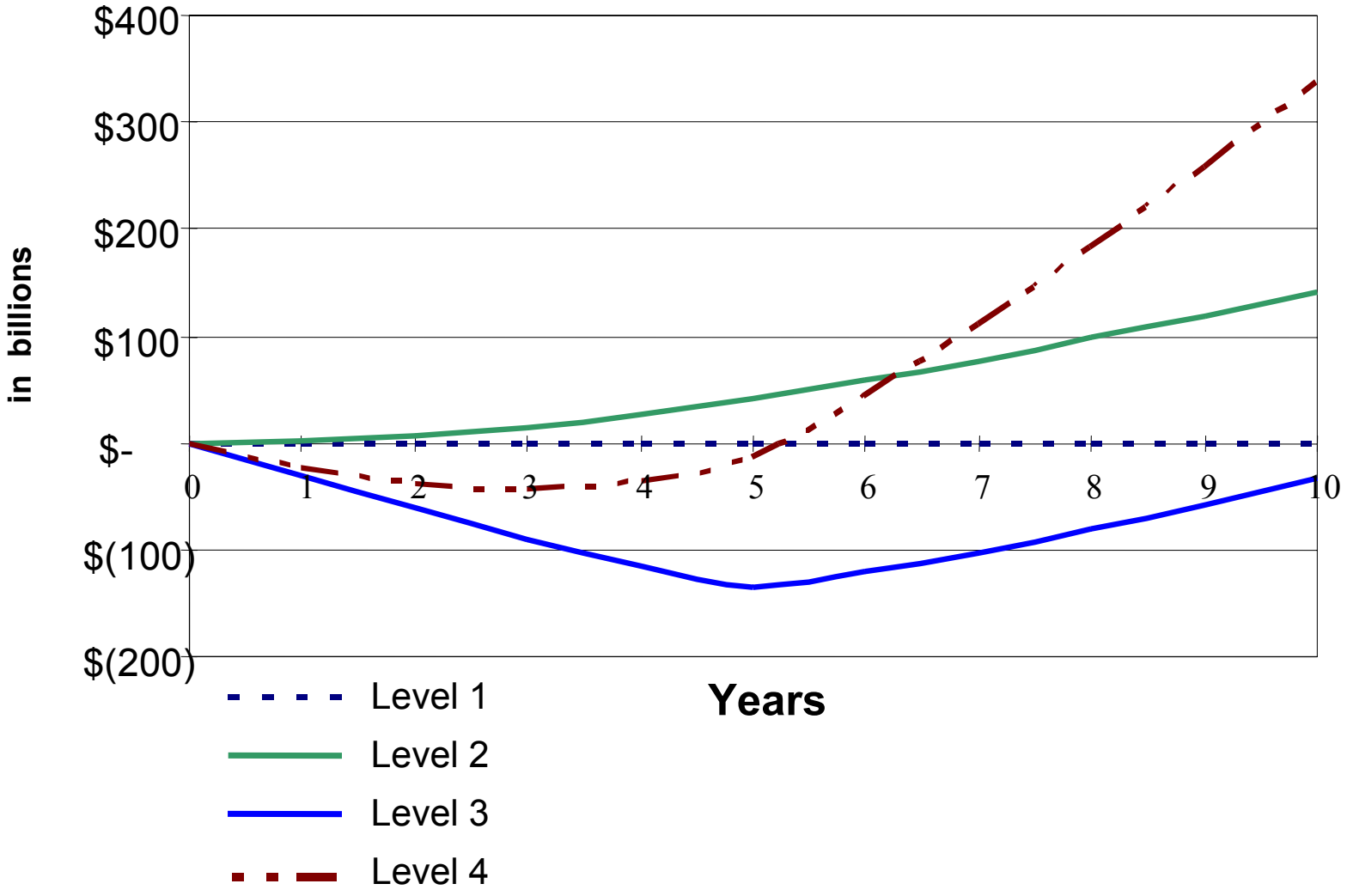
Year	1	2	3	4	5	6	7	8	9	10
Percent of potential return realized	10%	22%	36%	52%	70%	80%	88%	94%	98%	100%

HIEI National Net Cost-Benefit

	Net Return over 10-year Implementation	Annual Net Return after Implementation
Level 2	$141B	$22B
Level 3	-$34B	$24B
Level 4	$337B	$78B

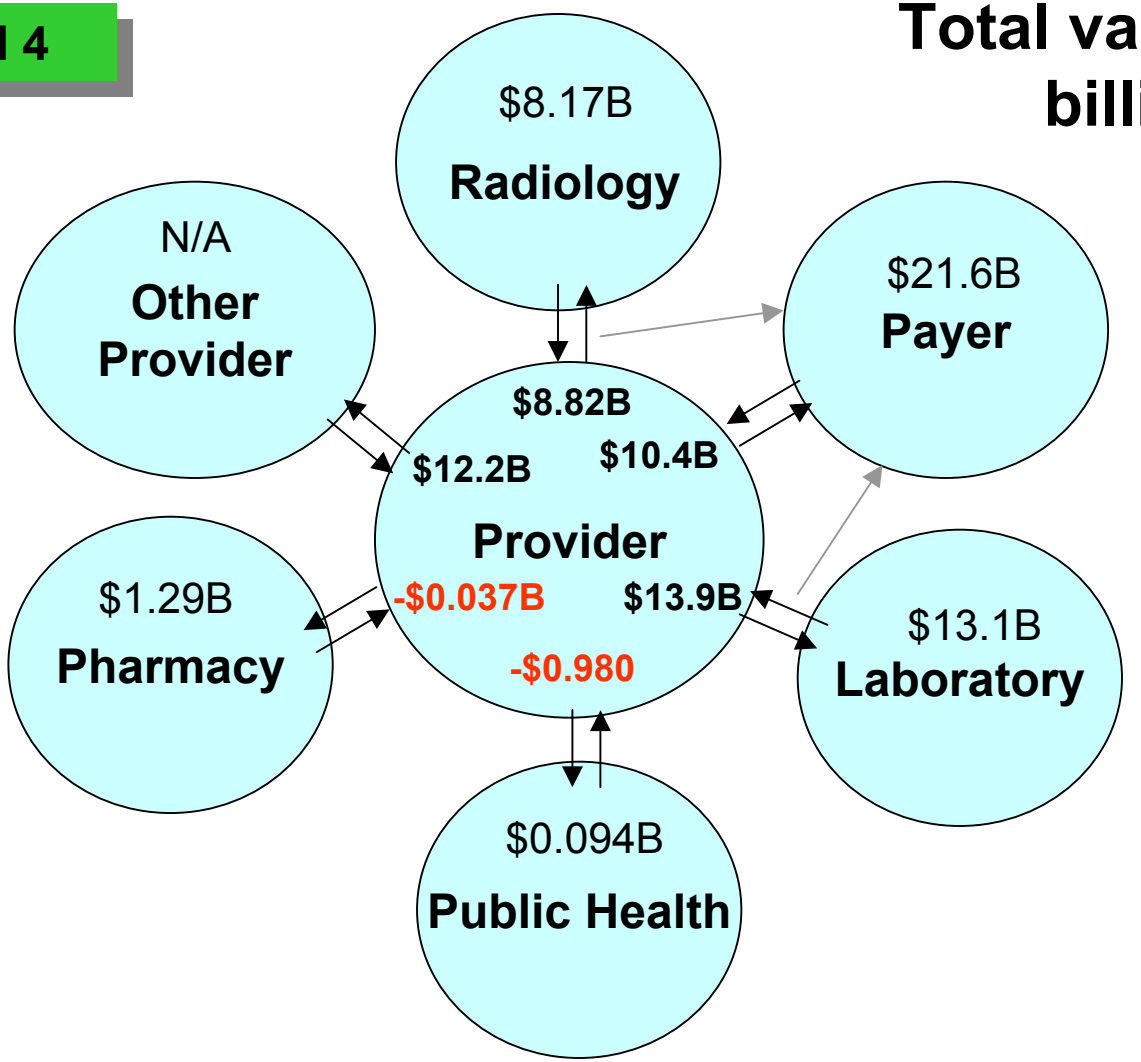
Value of HIE standards is the difference between Level 3 & 4

10-Year Cumulative Net Return by HIEI Level



Steady-State Net Annual Return

Level 4



Total value: $78 billion

Provider Net: **$34B** per year

Provider system maintenance cost of $10.5B not reflected in diagram

US Would Benefit from Healthcare Information Exchange

- Nationwide implementation of standardized healthcare information exchange would:
  - Save $337B over 10 years
  - Save the US $78B annually at steady state
  - Cumulative breakeven during year five of implementation
- There is a business case for standardized healthcare information exchange and interoperability

Limitations

- Our model combines evidence from the academic literature, experts, and market data
- We extrapolate to make national projections
- The model may be incomplete and important determinants missing

Limitations

- Benefit from secondary transactions beyond provider-centric, encounter-based model not included
- Secondary benefit from enhanced data integration not included
- Costs not included:
  - Stakeholder system cost (other than Providers and Hospitals)
  - Cost to develop, implement, and maintain standards
  - Volume discount associated with a national roll-out
  - Revenue loss to labs and radiology from reduction in tests
  - Conversion of legacy data

Conclusions

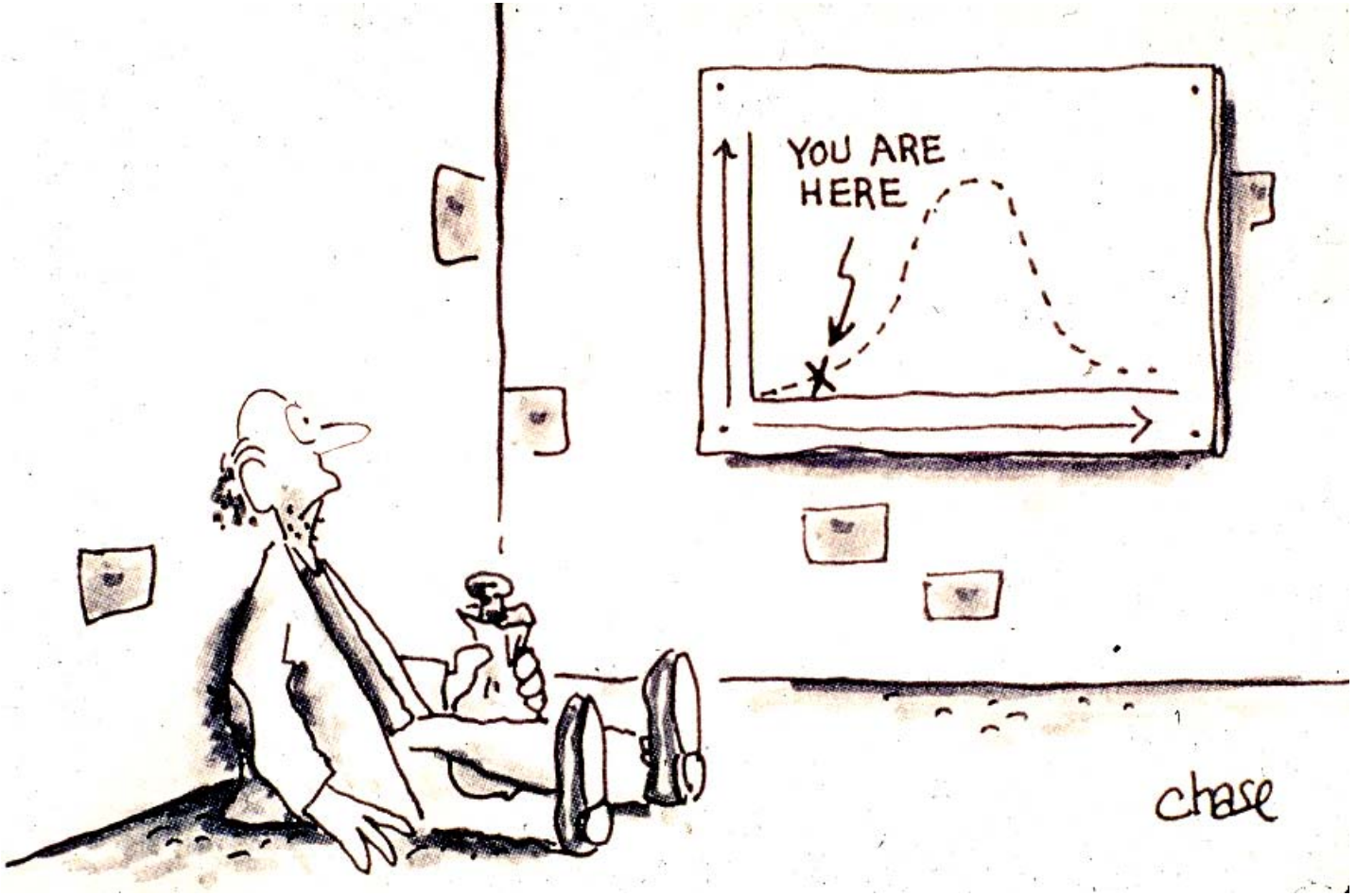
- ROI analyses of ACPOE suggest
  - $28K savings per provider
  - 12x greater ROI with advanced systems
  - Basic ACPOE systems do not produce positive returns
- ROI analyses of EHR suggest $31K benefit per provider
- Value of Healthcare Information Exchange
  - $78B year

For More Information

- See www.citl.org
- CITL Value of ACPOE Full Report
  - Executive Preview available at www.citl.org
- The Value of Healthcare Information Exchange and Interoperability Full Report

  - Reports available from www.CITL.org and www.HIMSS.org

Where Are We?



"I conclude that though the individual physician is not perfectible, the system of care is, and that the computer will play a major part in the perfection of future care systems."

Clem McDonald, MD
NEJM 295:1355, 1976

Thank you!

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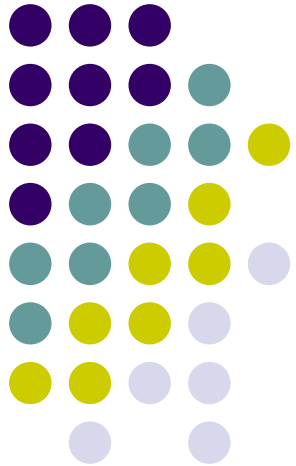

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